

IN THE CLAIMS:

MARKED-UP VERSION OF THE AMENDED CLAIMS:

1. (canceled)
2. (currently amended) [[The]] A drive device ~~as claimed in claim 1, for~~ passage barriers or thoroughfare barriers and door or gate drives, having a brushless DC servo motor, characterized in that  
a DC servo motor (5) has an associated servo controller and an output  
shaft of the DC servo motor (5) is connected directly and without an  
interconnection of a gear mechanism to the drive shaft of a barrier  
element (2);  
a horizontal plate (3), wherein the DC-servo motor is attached from below to  
the horizontal plate (3);  
wherein an output shaft penetrates through the horizontal plate (3) and is  
attached to a vertical edge of the barrier element (2);  
a post (1) attached to an upper side of the horizontal plate (3) and  
surrounding the drive shaft in an area disposed above the horizontal plate (3);  
and  
characterized by a compact complete control device which comprises the servo controller and a logic section and a housing not containing the DC-servo motor, and which serves to control the DC-servo motor (5) as a function of signals and wherein a rotation axis of the output shaft of the DC

servo motor (5) coincides with a rotation axis of the drive shaft of the barrier element (2).

3. (original) The drive device as claimed in claim 2, characterized in that the logic section is designed as a pluggable logic circuit board.

4. (previously presented) The drive device as claimed in claim 3, characterized in that

different logic circuit boards can be plug-connected, different movement profiles and programs, which are directed at various applications, are prespecified on said logic circuit boards, and said logic circuit boards have different numbers of inputs and outputs and different operator control and display elements, depending on requirements.

5. (previously presented) A drive device for passage barriers or thoroughfare barriers and door or gate drives, having a brushless DC servo motor, characterized in that a DC servo motor (5) has an associated servo controller and an output

shaft of the DC servo motor (5) is connected directly and without an interconnection of a gear mechanism to the drive shaft of a barrier element (2);

a horizontal plate (3), wherein the DC-servo motor is attached from below to the horizontal plate (3);

wherein an output shaft penetrates through the horizontal plate (3) and is attached to a vertical edge of the barrier element (2);

a post (1) attached to an upper side of the horizontal plate (3) and surrounding the drive shaft in an area disposed above the horizontal plate (3);

and

a transmitter system which is integrated in the motor and supplies the required control signals, wherein the motor mount is formed as a fixed mount on the side of the transmitter system, wherein the transmitter system is connected to the motor plate by means of plug connection or clamping, and wherein the plug connection is designed to be secure against polarity reversal and is provided with a locking means.

6. (canceled)

7. (canceled)

8. (canceled)

9. (currently amended) [[The]] A drive device as claimed in claim 1, for passage barriers or thoroughfare barriers and door or gate drives, having a brushless DC servo motor, characterized in that  
a DC servo motor (5) has an associated servo controller and an output shaft of the DC servo motor (5) is connected directly and without an interconnection of a gear mechanism to the drive shaft of a barrier element (2);  
a horizontal plate (3), wherein the DC-servo motor is attached from below to the horizontal plate (3);  
wherein an output shaft penetrates through the horizontal plate (3) and is attached to a vertical edge of the barrier element (2);  
a post (1) attached to an upper side of the horizontal plate (3) and surrounding the drive shaft in an area disposed above the horizontal plate (3);  
and  
characterized in that  
commutation and position control in the motor are performed by means of a magnetoresistive sensor.

10. (currently amended) [[The]] A drive device as claimed in claim 1, for passage barriers or thoroughfare barriers and door or gate drives, having a brushless DC servo motor, characterized in that  
a DC servo motor (5) has an associated servo controller and an output

shaft of the DC servo motor (5) is connected directly and without an interconnection of a gear mechanism to the drive shaft of a barrier element (2);  
a horizontal plate (3), wherein the DC-servo motor is attached from below to the horizontal plate (3);  
wherein an output shaft penetrates through the horizontal plate (3) and is attached to a vertical edge of the barrier element (2);  
a post (1) attached to an upper side of the horizontal plate (3) and

surrounding the drive shaft in an area disposed above the horizontal plate (3);  
and

characterized in that

commutation and position control in the motor are performed by means of resolvers or encoders or Hall sensors.

11. (canceled)

12. (canceled)

13. (previously presented) The drive device as claimed in claim 2,  
characterized in that inputs and outputs are separate from the actual motor

control system/logic circuit board and designed as an independent module.

14. (original) The drive device as claimed in claim 13, characterized in that the inputs and outputs can be connected by a pluggable bus connection or a pluggable, multicore cable.

15. (canceled)

16. (currently amended) [[The]] A drive device ~~as claimed in claim 15 further for passage barriers or thoroughfare barriers and door or gate drives, comprising~~

a horizontal plate (3) having a hole;

a brushless DC servo motor (5) mounted from below to the horizontal plate (3);

an output shaft formed at the brushless DC servo motor (5), extending through the hole in the horizontal plate (3) to an upper side of the horizontal plate (3) and having an axis;

a barrier element (2) disposed on the upper side of the horizontal plate (3);

a drive shaft formed at the barrier element (2) and having an axis, wherein the output shaft of the brushless DC servo motor (5) is solidly attached to the drive shaft formed at the barrier element (2) and wherein an axis of the output shaft and an axis of the drive shaft coincide;

a servo controller connected to the brushless DC servo motor (5); and  
further comprising,

a logic section connected to the servo controller;

a housing surrounding the servo controller and the logic section, wherein the servo controller, the logic section, and the housing form a compact complete control device which serves to control the brushless DC servo motor (5) as a function of signals, wherein the servo controller is furnished as a circuit board;

a locking unit (6) furnishing safe operation and holding the barrier element (2) securely in its closed position and in its open position and allowing the brushless DC-servo motor (5) and, respectively, the barrier element (2) to stop in any position:

energy storing means in the servo controller, wherein the barrier element (2) is automatically moved to its open position in the event of a power cut to provide unimpeded passage in spite of a fault or problem.

17. (previously presented) A drive device for passage barriers or thoroughfare barriers and door or gate drives, comprising

a brushless DC servo motor (5);

an output shaft formed at the brushless DC servo motor (5) and having an axis;

a barrier element (2);

a drive shaft formed at the barrier element (2) and having an axis, wherein the output shaft of the brushless DC servo motor (5) is solidly attached to the drive shaft formed at the barrier element (2) and wherein the axis of the output shaft and the axis of the drive shaft coincide; a servo controller connected to the brushless DC servo motor (5); a logic section connected to the servo controller; a housing surrounding the servo controller and the logic section, wherein the servo controller, the logic section, and the housing form a compact complete control device which serves to control the brushless DC servo motor (5) as a function of signals, wherein the servo controller is furnished as a circuit board; output stage modules disposed at the servo controller, wherein the logic section is constructed as a pluggable logic circuit board, wherein the housing is composed of an aluminum extruded profile with rails as retaining devices and integrated in the profile cross section for inserting the circuit board and with screw channels for fixing a lateral cover plate and an upper cover plate, wherein the lateral cover plate is firmly connected to the output stage modules of the servo controller and wherein the lateral cover plate serves simultaneously as a heat sink and to fix the servo controller circuit board in the control housing; a bus connected to the servo controller and to the logic section, wherein the servo controller and the logic section communicate through the bus;

a lateral aperture furnished in the lateral cover plate;  
an upper aperture furnished in the upper cover plate, and wherein the lateral aperture and the upper aperture are furnished for input and output terminals or plugs.

18. (previously presented) The drive device as claimed in claim 17, wherein different exchangeable logic circuit boards can be plug-connected, different movement profiles and programs which are directed at various applications are prespecified on said logic circuit boards, and said logic circuit boards have different numbers of inputs and outputs and different operator control and display elements, depending on a desired motion of the shaft of the brushless DC servo motor (5).

19. (currently amended) [[The]] A drive device ~~as claimed in claim 15,~~  
~~further for passage barriers or thoroughfare barriers and door or gate drives,~~  
comprising

a horizontal plate (3) having a hole;  
a brushless DC servo motor (5) mounted from below to the horizontal  
plate (3);  
an output shaft formed at the brushless DC servo motor (5), extending

through the hole in the horizontal plate (3) to an upper side of the horizontal plate (3) and having an axis;  
a barrier element (2) disposed on the upper side of the horizontal plate (3);  
a drive shaft formed at the barrier element (2) and having an axis, wherein  
the output shaft of the brushless DC servo motor (5) is solidly attached to  
the drive shaft formed at the barrier element (2) and wherein an axis of the  
output shaft and an axis of the drive shaft coincide;  
a servo controller connected to the brushless DC servo motor (5); and  
further comprising  
a post (1) attached to an upper side of the horizontal plate (3) and surrounding the drive shaft in an area disposed above the horizontal plate; a transmitter system which is integrated in the motor and supplies required control signals.

20. (previously presented) The drive device as claimed in claim 19, further comprising  
a motor mount formed on the bottom side of the horizontal plate (3) as a fixed mount on the side of the transmitter system.

21. (canceled)

22. (previously presented) The drive device as claimed in claim 19,

further comprising

a locking unit (6) connected to the barrier element (2), wherein the locking unit (6) holds the barrier element (2) securely in its closed position and its open position and allowing the brushless DC servo motor (2) to stop in any position, and wherein the plug connection is constructed to be secure against polarity reversal.

23. (currently amended) [[The]] A drive device as claimed in claim 15 further for passage barriers or

thoroughfare barriers and door or gate drives, comprising

a horizontal plate (3) having a hole:

a brushless DC servo motor (5) mounted from below to the horizontal plate (3);

an output shaft formed at the brushless DC servo motor (5), extending through the hole in the horizontal plate (3) to an upper side of the horizontal plate (3) and having an axis;

a barrier element (2) disposed on the upper side of the horizontal plate (3);

a drive shaft formed at the barrier element (2) and having an axis, wherein the output shaft of the brushless DC servo motor (5) is solidly attached to the drive shaft formed at the barrier element (2) and wherein an axis of the

output shaft and an axis of the drive shaft coincide;  
a servo controller connected to the brushless DC servo motor (5); and  
further comprising

a magnet wheel or a polarized magnetic ring;  
a magnetoresistive sensor sensing the magnet wheel or the polarized magnetic ring, wherein the magnetoresistive sensor is connected to the servo motor for performing commutation and position control in the brushless DC servo motor ((5)).

24. (previously presented) A drive device for passage barriers or thoroughfare barriers and door or gate drives, comprising

a horizontal plate (3) having a hole;  
a brushless DC servo motor (5) mounted from below to the horizontal plate (3);  
an output shaft formed at the brushless DC servo motor (5), extending through the hole in the horizontal plate (3) to an upper side of the horizontal plate (3) and having an axis;  
a barrier element (2) disposed on the upper side of the horizontal plate (3);  
a drive shaft formed at the barrier element (2) and having an axis, wherein the output shaft of the brushless DC servo motor (5) is solidly attached to the drive shaft formed at the barrier element (2) and wherein an axis of the output shaft and an axis of the drive shaft coincide;

a servo controller connected to the brushless DC servo motor (5);  
a logic section connected to the servo controller;  
a housing surrounding the servo controller and the logic section, wherein the servo controller, the logic section, and the housing form a compact complete control device which serves to control the brushless DC servo motor (5) as a function of signals, wherein the servo controller is furnished as a circuit board;  
a locking unit (6) furnishing safe operation and holding the barrier element (2) securely in its closed position and in its open position and allowing the brushless DC-servo motor (5) and, respectively, the barrier element (2) to stop in any position:  
energy storing means in the servo controller, wherein the barrier element (2) is automatically moved to its open position in the event of a power cut to provide unimpeded passage in spite of a fault or problem;  
wherein inputs and outputs are separate from the actual motor control system/logic circuit board and are constructed as an independent module.

25. (canceled)

26. (previously presented) A swivelable barrier comprising  
a flap (2) forming a barrier element;

a post (1), wherein the flap (2) is pivotable about the post (1);  
a shaft pivoting inside the post (1) and attached to the flap (2) for executing  
a pivoting motion of the flap (2);  
a horizontally disposed plate (3) supporting the post (1) and wherein the  
shaft penetrates the horizontally disposed plate (3);  
a brushless DC-servo motor (5) disposed beneath the horizontally disposed  
plate (3), wherein the shaft is connected directly and without an  
interconnection of a gear mechanism to the brushless DC-servo motor (5),  
wherein the flap (2) has a closed position and an open position,  
a locking unit holding the flap (2) securely in its closed position and in its  
open position and allowing the brushless DC-servo motor (5) and,  
respectively, the flap (2) to stop in any position;  
a table like base (4) incorporating the horizontally disposed plate (3);  
a servo controller connected to the brushless DC-servo motor (5) and serving  
as a direct drive and wherein a rotational speed and a torque of the brushless  
DC-servo motor is controlled independently of the direction of rotation and  
over an entire range of motion as desired and wherein acceleration profiles  
with acceleration and braking ramps at a beginning and an ending of a  
movement are preset in order to create smooth running behavior without  
overshooting and without sudden loads in the end positions for positioning  
the flap (2) very accurately.

27. (previously presented) The swivelable barrier as claimed in claim 26,

further comprising

a magneto resistive sensor connected to the brushless DC-servo motor in conjunction with a magnet wheel or a polarized magnetic ring for commutation and position control in the brushless DC-servo motor.

28. (previously presented) A drive device for passage barriers or

thoroughfare barriers and door or gate drives, comprising

a horizontal plate (3) having a hole;

a brushless DC servo motor (5) mounted from below to the horizontal plate (3);

an output shaft formed at the brushless DC servo motor (5), extending through the hole in the horizontal plate (3) to an upper side of the horizontal plate (3) and having an axis;

a barrier element (2) disposed on the upper side of the horizontal plate (3);

a drive shaft formed at the barrier element (2) and having an axis, wherein the output shaft of the brushless DC servo motor (5) is solidly attached to the drive shaft formed at the barrier element (2) and wherein an axis of the output shaft and an axis of the drive shaft coincide;

a servo controller connected to the brushless DC servo motor (5);

wherein the servo controller is furnished as a control circuit board; a logic section connected to the control circuit board and furnished as a pluggable logic circuit board; a control housing surrounding the control circuit board and the pluggable logic circuit board, wherein the control circuit board, the pluggable logic circuit board, and the control housing form a compact complete control device which serves to control the brushless DC servo motor (5) as a function of signals; output stage modules disposed at the control circuit board; a lateral cover plate; an upper cover plate; wherein the control housing is composed of an aluminum extruded profile with rails as retaining devices and integrated in the profile cross section for inserting the circuit boards and with screw channels for fixing the lateral cover plate and the upper cover plate, wherein the lateral cover plate is firmly connected to the output stage modules of the control circuit board and wherein the lateral cover plate serves simultaneously as a heat sink and to fix the control circuit board in the control housing.

29. (previously presented) The drive device as claimed in claim 28, further comprising a bus connected to the control circuit board and to the pluggable logic circuit board, wherein the control circuit board and the

pluggable logic circuit board communicate through the bus;

a lateral aperture furnished in the lateral cover plate;

an upper aperture furnished in the upper cover plate, and wherein the lateral aperture and the upper aperture are furnished for input and output terminals or plugs.

30. (previously presented) A drive device for passage barriers or thoroughfare barriers and door or gate drives, comprising

a horizontal plate (3) having a hole:

a brushless DC servo motor (5) mounted from below to the horizontal plate (3);

an output shaft formed at the brushless DC servo motor (5), extending through the hole in the horizontal plate (3) to an upper side of the horizontal plate (3) and having an axis;

a barrier element (2) disposed on the upper side of the horizontal plate (3);

a drive shaft formed at the barrier element (2) and having an axis, wherein the output shaft of the brushless DC servo motor (5) is solidly attached to the drive shaft formed at the barrier element (2) and wherein an axis of the output shaft and an axis of the drive shaft coincide;

a servo controller connected to the brushless DC servo motor (5);

wherein the servo controller is a control circuit board;

a logic circuit board connected to the control circuit board;

an independent input module connected to the control circuit board;

an independent output module connected to the control circuit board;

a pluggable bus connection or a pluggable multi core cable connecting the control circuit board or the logic circuit board to the independent input module or output module, wherein the control circuit board or the logic circuit board remain protected when mechanical loads are connected;

an insensitive connection circuit board of the input module and of the output module, wherein these mechanical loads are absorbed by the insensitive connection circuit board and wherein possible damage caused by improper handling will not lead to damage to an expensive motor/logic circuit board.

31. (canceled)